

What is claimed is:

- 1 1. A low noise block downconverter for use in a satellite broadcasting system  
2 receiver, said low noise block downconverter comprising:
  - 3 a. a first low noise amplifier for providing an amplified k-band RF  
4 signal;
  - 5 b. a local frequency oscillator for providing a local oscillator signal;
  - 6 c. a high frequency diplexer for providing a diplexer output signal, said  
7 high frequency diplexer being electrically connected to said low noise amplifier,  
8 where said high frequency diplexer further comprises at least a first diplexer input  
9 for receiving said amplified k-band RF signal, a second diplexer input for  
10 receiving said local oscillator signal, and a diplexer output for providing a diplexer  
11 output signal substantially equal to the sum of the amplified RF signal and the  
12 local oscillator signal; and
  - 13 d. a downconverter for receiving said diplexer output signal, wherein  
14 said downconverter provides an intermediate frequency output.
2. A low noise block downconverter according to claim 1 wherein said high  
frequency diplexer comprises a resistive summing junction.
3. A low noise block downconverter according to claim 1, wherein said high  
frequency diplexer comprises a distributed element frequency selective junction.
4. A low noise block downconverter according to claim 1, wherein said high  
frequency diplexer comprises a lumped element frequency selective junction.

5. A low noise block downconverter according to claim 1 wherein said downconverter comprises an integrated circuit chip.
6. A low noise block downconverter according to claim 5 wherein said integrated circuit chip comprises at least a first diode and a second diode, wherein said first diode and said second diode form an anti-parallel diode pair, said anti-parallel diode pair being electrically connected to high frequency diplexer.
7. A low noise block downconverter according to claim 6 wherein said anti-parallel diode pair produces an intermediate frequency.
8. A low noise block downconverter according to claim 7 wherein said local oscillator signal is from about 9.75 GHz to about 11.3 GHz.
9. A low noise block downconverter according to claim 8, wherein said intermediate frequency is from about 950 MHz to about 2.15 GHz.
10. A low noise block downconverter according to claim 9 wherein said integrated circuit chip is configured in a sub-harmonically pumped arrangement.
11. A k-band mixer for use in a low noise block downconverter comprising:

- 2           a.       a high frequency diplexer for providing a diplexer output signal, said  
3 high frequency diplexer having at least a first diplexer input for receiving a k-band  
4 RF signal, a second diplexer input for receiving a local oscillator signal,  
5           b.       a local frequency oscillator for providing said local oscillator signal  
6 to said second diplexer input; and  
7           c.       a downconverter configured to downconvert said diplexer output  
8 signal to provide an intermediate frequency output.

12.    A k-band mixer according to claim 11 wherein said high frequency diplexer comprises a resistive summer.

13.    A k-band mixer according to claim 14 wherein said high frequency diplexer comprises a lumped element selective junction.

14.    A k-band mixer according to claim 13 wherein said high frequency diplexer comprises a distributed frequency selective junction.

15.    A k-band mixer according to claim 14 wherein said downconverter comprises an integrated circuit chip, said integrated circuit chip having at least a first chip input, a second chip input and a chip output.

16.    A k-band mixer according to claim 15 wherein said integrated chip further comprises at least a first diode and a second diode, wherein said first diode and

said second diode form an anti-parallel diode pair, said anti-parallel diode pair being electrically connected to said diplexer.

17. A k-band frequency mixer according to claim 16 wherein said high frequency diplexer combines said k-band RF signal and said local oscillator signal to produce a combined high frequency signal, said combined high frequency signal being provided to said anti-parallel diode pair.

18. A k-band frequency mixer according to claim 17 wherein said anti-parallel diode pair produces an intermediate frequency.

19. A k-band frequency mixer according to claim 18 wherein said local oscillator signal is from about 9.75 GHz to about 11.3 GHz.

20. A k-band mixer according to claim 19, wherein said intermediate frequency is from about 950 MHz to about 2.15 GHz.

21. A k-band mixer according to claim 20, wherein said integrated circuit chip is configured in a sub-harmonically pumped arrangement.

- 1 22. A method for downconverting a k-band radio frequency, said method
- 2 comprising:
- 3 combining a local oscillator frequency and a k-band RF frequency to
- 4 produce a high frequency signal; and

5           inputting the high frequency signal into a downconverter to produce an  
6   intermediate frequency of from about 950 MHz to about 2.15 GHz, said  
7   downconverter comprising an integrated circuit chip containing an anti-parallel  
8   diode pair.

24. A method according to claim 23 wherein method further comprises the step of amplifying said intermediate frequency to a predetermined frequency.